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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/069,668	04/29/1998	KIE Y. AHN	303.466US1	3628

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EXAMINER

COLEMAN, WILLIAM D

ART UNIT PAPER NUMBER

2823

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/069,668

Applicant(s)

AHN ET AL.

Examin r

W. David Coleman

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-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30,32-38 and 40-42 is/are pending in the application.
- 4a) Of the above claim(s) 29 and 30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28,32-38 and 40-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-28 and 32-39 recites the limitation "metal" in independent claims 1, 4, 6, 12, 18, 20, 23, 28, 32, 33 and 35. There is insufficient antecedent basis for this limitation in the claim. Correction is required. Prior to the amendment filed February 21, 2001, Applicants used the term "substituting metal for at least a portion of the polysilicon structure", which is clear and there is no ambiguity. Applicant's amendment filed on or after February 21, 2001, Applicant's amended claim was changed to "cross-diffusing a metal for at least a polysilicon portion". The Examiner's position is that to cross-diffuse a metal for at least the polysilicon portion, a metal must be deposited or formed prior to cross-diffusion.

3. Applicants have not provided a reasonable disclosure to provide for such a process step, i.e., the metal must be provided before it can be cross-diffused. Applicants claim to substantially replace a portion of the polysilicon with aluminum and after cross-diffusing produce a metal emitter entirely above the surface of the substrate at the emitter region. Please note that there is a metal layer above the surface of the substrate at the emitter region position in the Tsai teachings.

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According to the conventional Laws of Physics, matter is neither created nor destroyed, however, Applicants are implying that cross-diffusing aluminum will substantially replace polysilicon.

This would be reasonable if Applicant's provided a specific amount of polysilicon material and a specific amount of aluminum which would be more than the polysilicon layer and decided to form aluminum contacts alloyed with a small amount of silicon. However, as the interpreted by what is written in the claims and disclosed in the Application, Applicant does not have support for substantially substituting all of the polysilicon for aluminum as claimed.

4. Correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 28, 32, 33, 35, 36, 37, 38, 39, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, U.S. Patent 5,235,204 in view of Hori, "Novel High Aspect Ratio Aluminum Plug for Logic/DRAM LSIs Using Polysilicon-Aluminum Substitute (PAS), IEEE, IDEM, December 1996, pp. 14.7.1-14.7.3

7. Pertaining to claims, 1, 4, 5, 7, 8, 9, 10, 28, 35, 36, 37, 38, 39, 40 and 41, Tsai discloses a semiconductor process substantially as claimed. See **FIG. 6**, where a method of making an emitter contact for an emitter region of a bipolar transistor is disclosed. Tsai discloses a polysilicon structure **60** over an emitter region position of a semiconductive substrate (not numbered). However, the metal emitter contact is not formed by cross diffusing the metal and a

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portion of the polysilicon structure. Hori teaches the use of a polysilicon-aluminum substitute (see Abstract). In view of Hori, it would have been obvious to one of ordinary skill in the art to incorporate the polysilicon-aluminum substitute of Hori into the Tsai semiconductor process because it will result in Applicants "cross-diffusing metal and at least a portion of the polysilicon layer to thereby form an emitter contact.

8. Pertaining to claim 2, Tsai discloses an emitter region 40 as seen in **FIG. 6**. However, in the absence of new or unexpected results, the mere reversal of the order of performing process steps has been held to be prima facie obvious. In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946).

9. Pertaining to claim 3, Tsai discloses that the emitter region 40 is polysilicon and metallurgy level being aluminum, which is obviously a doped layer (p-type) that will outdiffuse into the polysilicon region when annealed.

10. Pertaining to claim 11, Tsai discloses that the metal layer 64, can be aluminum.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, U.S. Patent 5,235,204 in view of Hori, "Novel High Aspect Ratio Aluminum Plug for Logic/DRAM LSIs Using Polysilicon-Aluminum Substitute (PAS), IEEE, IDEM, December 1996, pp. 14.7.1-14.7.3 as applied to claims 1-3 and 7-11 above, and further in view of Aboelfotoh et al., U.S. Patent 5,801,444.

12. The combined teachings of Tsai in view of Hori discloses a semiconductor process substantially as claimed as discussed above. However the combined teachings fail to disclose a polysilicon layer that includes polysilicon and germanium. Aboelfotoh discloses a

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semiconductor process wherein germanium is included with silicon for the purpose of making electrical contacts. See **FIG. 11** of Aboelfotoh, where germanium (11) is deposited with polysilicon for the purposes of a contact for a semiconductor device. In view of Aboelfotoh it would have been obvious to one of ordinary skill in the art to include germanium with polysilicon for contact formation because a substantial advantage to be gained is that electrically stable contact metallization (column 5, lines 49-51).

Information Disclosure Statement

13. It is desirable for an attorney or agent to carefully evaluate and explain to the applicant and others involved the scope of the claims, particularly the broadest claims. Ask specific questions about possible prior art which might be material in reference to the broadest claim or claims. There is some tendency to mistakenly evaluate prior art in the light of the gist of what is regarded as the invention or narrower interpretations of the claims, rather than measuring the art against the broadest claim with all of its reasonable interpretations.

14. It is desirable to pick out the broadest claim or claims and measure the materiality of prior art against a reasonably broad interpretation of these claims.

15. It may be useful to evaluate the materiality of prior art or other information from the viewpoint of whether it is the closest prior art or other information. This will tend to put the prior art or other information in better perspective. See *Semiconductor Energy Laboratory Co. v. Samsung Electronics Co.*, 204 F.3d 1368, 1374, 54 USPQ2d 1001, 1005 (Fed. Cir. 2000) (“A withheld reference may be highly material when it discloses a more complete combination of relevant features, even if those features are before the patent examiner in other references.”)

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(citations omitted)). However, 37 CFR 1.56 may still require the submission of prior art or other information which is not as close as that of record.

16. Care should be taken to see that prior art or other information cited in a specification or in an information disclosure statement is properly described and that the information is not incorrectly or incompletely characterized. It is particularly important for an attorney or agent to review, before filing, an application which was prepared by someone else, e.g., a foreign application. It is also important that an attorney or agent make sure that foreign clients, including foreign applicants, attorneys, and agents understand the requirements of the duty of disclosure, and that the U.S. attorney or agent review any information disclosure statements or citations to ensure that compliance with 37 CFR 1.56 is present.

See *Semiconductor Energy Laboratory Co. v. Samsung Electronics Co.*, 204 F.3d 1368, 54 USPQ2d 1001 (Fed. Cir. 2000). During prosecution patentee submitted an untranslated 29-page Japanese reference as well as a concise explanation of its relevance and an existing one-page partial English translation, both of which were directed to less material portions of the reference. The untranslated portions of the Japanese reference “contained a more complete combination of the elements claimed [in the patent] than anything else before the PTO.” 204 F.3d at 1374, 54 USPQ2d at 1005. The patentee, whose native language was Japanese, was held to have understood the materiality of the reference. “The duty of candor does not require that the applicant translate every foreign reference, but only that the applicant refrain from submitting partial translations and concise explanations that it knows will misdirect the examiner’s attention from the reference’s relevant teaching.” 204 F.3d at 1378, 54 USPQ2d at 1008. See also

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Genveto Jewelry Co. v. Lambert Bros., Inc., 542 F. Supp. 933, 216 USPQ 976 (S.D.N.Y. 1982)

wherein a patent was held invalid or unenforceable because patentee's foreign counsel did not disclose to patentee's United States counsel or to the Office prior art cited by the Dutch Patent Office in connection with the patentee's corresponding Dutch application. The court stated, 542 F. Supp. at 943, 216 USPQ at 985:

17. Foreign patent attorneys representing applicants for U.S. patents through local correspondent firms surely must be held to the same standards of conduct which apply to their American counterparts; a double standard of accountability would allow foreign attorneys and their clients to escape responsibility for fraud or inequitable conduct merely by withholding from the local correspondent information unfavorable to patentability and claiming ignorance of United States disclosure requirements.

18. Care should be taken to see that inaccurate statements or inaccurate experiments are not introduced into the specification, either inadvertently or intentionally. For example, stating that an experiment "was run" or "was conducted" when in fact the experiment was not run or conducted is a misrepresentation of the facts. No results should be represented as actual results unless they have actually been achieved. Paper examples should not be described using the past tense. See MPEP § 608.01(p) and § 707.07(l). Also, misrepresentations can occur when experiments which were run or conducted are inaccurately reported in the specification, e.g., an experiment is changed by leaving out one or more ingredients. See *Steierman v. Connelly*, 192 USPQ 433 (Bd. Pat. Int. 1975); 192 USPQ 446 (Bd. Pat. Int. 1976).

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19. Do not rely on the examiner of a particular application to be aware of other applications belonging to the same applicant or assignee. It is desirable to call such applications to the attention of the examiner even if there is only a question that they might be “material to patentability” of the application the examiner is considering. It is desirable to be particularly careful that prior art or other information in one application is cited to the examiner in other applications to which it would be material. Do not assume that an examiner will necessarily remember, when examining a particular application, other applications which the examiner is examining, or has examined. See *Armour & Co. v. Swift & Co.*, 466 F.2d 767, 779, 175 USPQ 70, 79 (7th Cir. 1972); *KangaROOS U.S.A., Inc. v. Caldor, Inc.*, 585 F. Supp. 1516, 1522, 1528-29, 222 USPQ 703, 708, 713-14 (S.D. N.Y. 1984), vacated and remanded, 778 F.2d 1571, 228 USPQ 32 (Fed. Cir. 1985).

20. While vacating the summary judgment and remanding for trial in *KangaROOS*, the Court of Appeals for the Federal Circuit stated that a “lapse on the part of the examiner does not excuse the applicant.” 778 F.2d at 1576, 228 USPQ at 35.

21. When in doubt, it is desirable and safest to submit information. Even though the attorney, agent, or applicant doesn’t consider it necessarily material, someone else may see it differently and embarrassing questions can be avoided. The court in *U.S. Industries v. Norton Co.*, 210 USPQ 94, 107 (N.D. N.Y. 1980) stated “In short, the question of relevancy in close cases, should be left to the examiner and not the applicant.”

See also *LaBounty Mfg., Inc. v. U.S. Int ’l Trade Comm ’n*, 958 F.2d 1066, 22 USPQ2d 1025 (Fed. Cir. 1992).

22. One of the requirements for obtaining a patent is “Whoever invents or

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discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of 35 U.S.C. 101”.

23. Because Applicant/Applicant's have various issued Patents and/or Patent Applications containing similar scope of invention and have not listed these Patents and/or Patent Applications containing the same subject matter that is pertinent to the information disclosure statement, the Examiner cannot distinguish between the Applications and issued patents as to what is new.

Please note that the Hori reference is pertinent to Applicants invention and was cited in various related Applications, however, the reference was omitted in the present Application.

Double Patenting

24. Claims 1-28, 32-38 and 40-42 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 1-31 of U.S. Patent Application Publication, US 2002/0014660A1 (please note that the gate insulator layer and the diffusion barrier layer prevent dopants to diffuse through the gate oxide and therefore are equivalent to each other). When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Conclusion

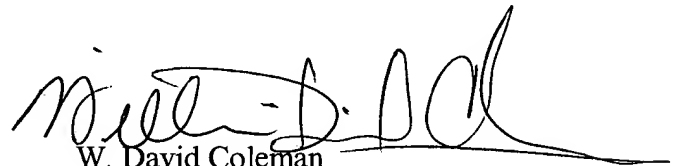
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25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 703-305-0004.

The examiner can normally be reached on 9:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

A handwritten signature in black ink, appearing to read 'W. David Coleman', is written over a horizontal line.

W. David Coleman

Examiner

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WDC

September 16, 2003